Airport Sta.

Ferndale Sta.

BROADMOOR

STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION

MASS TRANSIT ADMINISTRATION

CENTRAL LIGHT RAIL LINE

HOWARD STREET TRACK RECONSTRUCTION - PHASE II

CONTRACT NO. T-0857-0140 JULY 27, 2001



Daniel, Mann, Johnson, & Mendenhall Earth Tech a joint venture





MASS TRANSIT ADMINISTRATION

M. Jarmanana Manager of Facilities Engineering

7-27-01 DATE

SHEET DRAWING NO. NO. TITLE

CONTRACT DRAWINGS

- 1 COVER SHEET
- 2 G-1 INDEX OF DRAWINGS
- G-2 INDEX OF REFERENCE DRAWINGS
- 4 G-3 ABBREVIATIONS, SYMBOLS & GENERAL NOTES
- 5 G-4 VICINITY MAI
- 6 T-15 LIMITS OF DEMOLITION IN EXISTING TRACK
- 7 T-16 DETAILS ELASTOMERIC BOOT / PLATE-SHT 1 OF 2
- 8 T-17 DETAILS ELASTOMERIC BOOT / PLATE-SHT 2 OF 2
- 9 T-20 DETAILS RESTRAINING RAIL AND RAIL BOOT
- 10 T-21 RESTRAINING RAIL LAYOUT AND DETAIL
- 11 T-25 DETAILS TRACK DRAINS
- 12 T-26 REPLACEMENT OF CROSS-BONDING & NEG RET CAB

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				NSS SDJ	CENTRAL LIGHT RAIL LINE	CONTRACT NO.
				N Q	HOWARD STREET TRACK RECONSTRUCTION	T-0857-0140
				DRAM TRS	PHASE II	DRAWING NO.
					INDEX OF DRAWINGS	G-1
NO	DESCRIPTION	DV	DATE	5	INDEX OF DRAWINGS	SHEET NO.
NU.	REVISIONS	BY	DATE	TMK	DATE: 7/27/01 SCALE: NONE	OF

SHEET <u>NO.</u>	DRAWING <u>NO.</u>	TITLE		SHEET <u>NO.</u>	DRAWING <u>NO.</u>	TITLE
_ "	ENCE DRAWING ORIGINAL CON	S ISTRUCTION CONTRACT NO. CL03)	•	40	CC-009-01	CROSS SECTIONS STA. N/E 36+00 AND STA. N/E 41+00 OPTION A
13	CG-016-01 CG-017-01	TRACK ALIGNMENT DATA TRACK ALIGNMENT DATA		41	CC-013-03	CROSS SECTIONS STA. N/E 63+00 AND STA. N/E 65+50 OPTION A
15 16	CG-018-00 CG-019-00	TRACK ALIGNMENT DATA TRACK ALIGNMENT DATA		42	CD-001-02	SITE DEVELOPMENT PLAN STA. S/W 15+50 TO STA. S/W 15+00
17	RC-016-00	VERTICAL CONTROL DIAGRAM AND DESCRIPTIONS		43	CD-002-06	SITE DEVELOPMENT PLAN STA. S/W 15+00 TO STA. S/W 8+80
18	RC-017-00	HORIZONTAL CONTROL DIAGRAM & DATA		44	CD-003-06	SITE DEVELOPMENT PLAN STA. S/W 8+80 TO STA. S/W 2+70
19	RC-018-00	HORIZONTAL CONTROL REFERENCE DIAGRAMS		45	CD-004-02	SITE DEVELOPMENT PLAN STA. S/W 2+70 TO STA. N/E 3+40
20	CG-001-01	GENERAL ALIGNMENT PLAN STA. S/W 15+50 TO STA. S/W 15+00		46	CD-005-04	SITE DEVELOPMENT PLAN STA. N/E 3+40 TO STA. N/E 9+50
21	CG-002-02	GENERAL ALIGNMENT PLAN STA. S/W 15+00 TO STA. S/W 8+80		47	CD-006-03	SITE DEVELOPMENT PLAN STA. N/E 9+50 TO STA. N/E 15+60
22	CG-003-01	GENERAL ALIGNMENT PLAN STA. S/W 8+80 TO STA. S/W 2+70		48	CD-007-02	SITE DEVELOPMENT PLAN STA. N/E 15+60 TO STA. N/E 21+65
23	CG-004-02	GENERAL ALIGNMENT PLAN STA. S/W 2+70 TO STA. N/E 3+40		49	CD-008-04	SITE DEVELOPMENT PLAN STA. N/E 21+65 TO STA. N/E 27+75
24	CG-005-00	GENERAL ALIGNMENT PLAN STA. N/E 3+40 TO STA. N/E 9+50		50	CD-009-02	SITE DEVELOPMENT PLAN STA. N/E 27+75 TO STA. N/E 33+80
25	CG-006-01	GENERAL ALIGNMENT PLAN STA. N/E 9+50 TO STA. N/E 15+60		51	CD-010-03	SITE DEVELOPMENT PLAN STA. N/E 33+80 TO STA. N/E 39+90
26	CG-007-01	GENERAL ALIGNMENT PLAN STA. N/E 15+60 TO STA. N/E 21+65		52	CD-011-03	SITE DEVELOPMENT PLAN STA. N/E 39+90 TO STA. N/E 45+80
27	CG-008-00	GENERAL ALIGNMENT PLAN STA. N/E 21+65 TO STA. N/E 27+75		53	CD-012-04	SITE DEVELOPMENT PLAN STA. N/E 45+80 TO STA. N/E 52+00
28	CG-009-01	GENERAL ALIGNMENT PLAN STA. N/E 27+75 TO STA. N/E 33+80		54	CD-013-05	SITE DEVELOPMENT PLAN STA. N/E 52+00 TO STA. N/E 58+00
29	CG-010-00	GENERAL ALIGNMENT PLAN STA. N/E 33+80 TO STA. N/E 39+90		55	CD-014-06	SITE DEVELOPMENT PLAN STA. N/E 58+00 TO STA. N/E 63+00
30	CG-011-00	GENERAL ALIGNMENT PLAN STA. N/E 39+90 TO STA. N/E 45+80		56	TS-352-01	TYPICAL EMBEDDED TRACK ARRANGEMENTS OPTION A
31	CG-012-01	GENERAL ALIGNMENT PLAN STA. N/E 45+80 TO STA. N/E 52+00		57	TS-353-02	TYPICAL EMBEDDED TRACK ARRANGEMENTS OPTION A
32	CG-013-00	GENERAL ALIGNMENT PLAN STA. N/E 52+00 TO STA. N/E 58+00		58	TS-354-03	EMBEDDED TRACK DETAILS RAIL/RAIL WITH STRAP GUARD OPTION A
33	CG-014-00	GENERAL ALIGNMENT PLAN STA. N/E 58+00 TO STA. N/E 63+00		59	TS-355-00	TRANSITION SECTION EMBEDDED TRACK TO BALLASTED TRACK
34	CG-015-03	GENERAL ALIGNMENT PLAN STA. N/E 63+00 TO STA. N/E 68+50		60	TS-501-00	OPTION A AND B 115 RE STRAP GUARD
35	CC-001-02	CROSS SECTIONS STA. S/W 14+00 AND STA. S/W 12+00 OPTION A		61	TS-502-00	FOR SPECIAL TRACKWORK INSTALLATION 115 RE RAIL STRAP GUARD
36	CC-002-02	CROSS SECTIONS STA. S/W 10+00 AND STA. S/W 9+15		62	TS-503-00	ENDS, JOINTS AND HOLES STRAP GUARDED CURVES PRIMARY TRACK
37	CC-003-01	OPTION A CROSS SECTIONS		63	TS-537-00	TABLES AND NOTES EMBEDDED TRACK
		STA. S/W 8+00 AND STA. S/W 5+00 OPTION A		64	TS-539-00	TRACK DRAINAGE TROUGH LAYOUT EMBEDDED TRACK TRACK DRAINAGE TROUGH DETAILS
38	CC-004-00	CROSS SECTIONS STA. S/W 1+00 AND STA. S/W 3+00 OPTION A				TRACK DRAINAGE TROUGH DETAILS
39	CC-005-02	CROSS SECTIONS STA. N/E 3+00 AND STA. N/E 5+00 OPTION A				

MARYLAND DEPARTMENT OF TRANSPORTATION





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CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II

T-0857-0140 DRAWING NO.

SCALE: NONE

G-2 SHEET NO. <u>3</u> of _

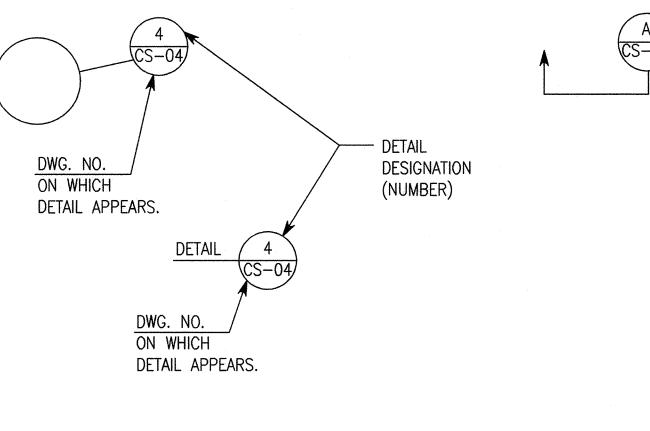
CONTRACT NO.

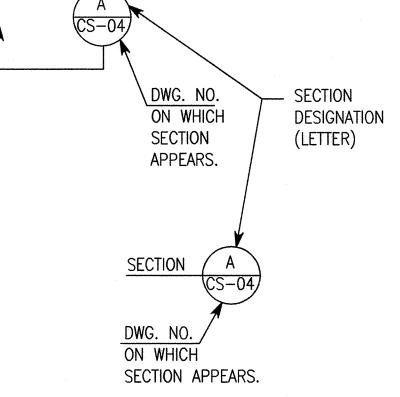
INDEX OF REFERENCE DRAWINGS

DATE: 7/27/01

ASPHALT CONCRETE AMERICAN RAILWAY ENGINEERING ASSOCIATION BENCH MARK BALTIMORE WASHINGTON INTERNATIONAL AIRPORT CONCRETE CURVE TO SPIRAL DIA DIAMETER DWG DRAWING EAST, EXTERNAL DISTANCE (FOR CIRCULAR CURVE) ACTUAL SUPERELEVATION UNBALANCED SUPERELEVATION **ELEV** ELEVATION **EQUATION** EQN **EXIST EXISTING EXPRESSWAY** GRADE BREAK HIGH BLOCK HORIZONTAL INSIDE DIAMETER LENGTH OF CIRCULAR CURVE LENGTH OF SPIRAL MAXIMUM MANHOLE MIN MINIMUM MO MIDDLE ORDINATE MPH MILES PER HOUR MT MOUNT MTA MASS TRANSIT ADMINISTRATION NORTH NORTHBOUND NORTHEAST NOT IN CONTRACT NO NUMBER NORTHWEST OUTSIDE DIAMETER POINT OF CURVATURE POINT OF INTERSECTION POUNDS PER SQUARE INCH POINT OF INTERSECTION OF TURNOUT POINT OF TANGENCY POINT OF VERTICAL CURVE PVI POINT OF VERTICAL INTERSECTION PAVEMENT POINT OF VERTICAL TANGENT RADIUS ROAD REQD REQUIRED SOUTHBOUND SPIRAL TO CURVE SOUTHEAST STREET, SPIRAL TO TANGENT STA STATION SOUTHWEST TOP OF RAIL TANGENT TO SPIRAL TANGENT LENGTH FROM TS TO MAIN PI

CENTERLINE EXISTING MATERIALS, FACILITIES, OR GRADE POINT OF INTERSECTION, VERTICAL POINT OF INTERSECTION **EQUATION IN STATIONING** CONCRETE **GROUT** [+++++++++++] <u>|++++++++++</u> ELASTOMERIC GROUT 1+++++++++++ SUBGRADE





<u>DETAILS</u>

<u>SECTIONS</u>

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UNBALANCED SUPERELEVATION

CENTRAL ANGLE OF CIRCULAR CURVE

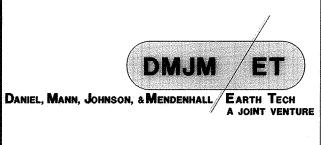
VELOCITY

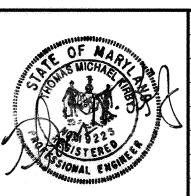
VERTICAL

DIAMETER SPIRAL ANGLE

NUMBER

VERTICAL CURVE





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REVISIONS

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	DESGN SDJ	CENTRAL LIGHT RAIL LIN HOWARD STREET TRACK RECONS
	- TRS	PHASE II
	CHC CHCC	ABBREVIATIONS, SYMBOLS & GENERA
DATE	E TMK	

DATE: 7/27/01

TMK

CONTRACT NO. T-0857-0140 ISTRUCTION DRAWING NO. G-3 SHEET NO.

RAL NOTES **4** OF SCALE: NONE

1. ALL COORDINATES ARE BASED ON THE MARYLAND STATE COORDINATE SYSTEM, AS ADJUSTED FOR THE CLRL PROJECT.

GENERAL NOTES

2. ALL ELEVATIONS AND BENCHMARKS ARE BASED ON USC&GS MEAN SEA LEVEL DATUM, 1929 ADJUSTMENT.

3. HORIZONTAL AND VERTICAL DISTANCES ARE IN FEET, EXCEPT AS NOTED OTHERWISE.

4. RECONSTRUCT TRACKS TO THE HORIZONTAL TRACK ALIGNMENT OF THE ORIGINAL MTA CLRL TRACK CONSTRUCTION CONTRACT NO. CLO3, AS BUILT. FOR HORIZONTAL TRACK DATA, REFER TO INCLUDED CONTRACT NO. CLO3 REFERENCE DWG. NOS. CG-016-01 THROUGH CG-019-00

5. THE ADMINISTRATION WILL PROVIDE THE CONTRACTOR A SURVEY OF THE EXISTING VERTICAL TRACK ALIGNMENT. THE CONTRACTOR SHALL REINSTALL RAILS TO THE EXISTING TOP OF RAIL PROFILE. THE ENGINEER MAY DIRECT THE CONTRACTOR TO RAISE THE TOP OF RAIL PROFILE AS MUCH AS 1/4" AT CERTAIN LOCATIONS, AT NO COST TO THE ADMINISTRATION. FOR THOSE LOCATIONS, THE ENGINEER WILL PROVIDE VERTICAL ALIGNMENT INFORMATION.

							SUMM	IARY OF W	ORK					
SITE LIMITS OF WORK				de la companya de la	REQUIRED WORK (SEE NOTE 1)									
NO	TRACK	DESCRIPTION	FRC	ОМ	•	ТО	APPROXIMATE LENGTH OF TRACK (TRACK FEET)	REMOVE EMBEDMENT CONCRETE AROUND RAILS AND PLACE RAIL BOOT (RAIL FEET)	REMOVE STRAP GUARD & EXISTING RUNNING RAILS	REPLACE RUNNING RAILS (RAIL FEET)	PLACE RESTRAINING RAIL (RAIL FEET)	TRACK	LOCATIONS OF CROSS BONDS TO REPLACE (QTY)	LOCATIONS OF NEGATIVE RETURN CABLES TO REPLACE (QTY)
1	SB	CAMDEN ST. TO PRATT ST.	S/W 1	5+10	S/W	12+45	265	530				2		
2	SB	PRATT ST. TO LOMBARD ST.	S/W	9+66	S/W	8+15	151	302				2		
3	SB	LOMBARD STREET	S/W	6+75	S/W	6+25	35	70		75	35			
4	SB	LOMBARD ST. TO BALTIMORE ST.	S/W	5+15	S/W	1+35	380	760				2		
5	SB	BALTIMORE ST. TO FAYETTE ST.	N/W	1+19	N/W	3+37	218	436	101	101				
6	SB	FAYETTE ST. TO SARATOGA ST.	N/W	4+38	N/W	12+18	780	1560				3	1	
7	SB	SARATOGA ST. TO MULBERRY ST.	N/W 1	3+28	N/W	15+90	262	524	114	114		1		
8	SB	MULBERRY ST. TO FRANKILN ST.	N/W 1	7+55	N/W	20+30	275	550	19	19		2	1	
9	SB	FRANKLIN ST. TO MADISON ST.	N/W 2	21+33	N/W	31+75	1042	2084	216	216		4	1	1
10	SB	MADISON ST. TO ARMORY ST.	N/W 3	54+44	N/W	37+73	329	658						
11	SB	ARMORY ST. TO M.L. KING BLVD.	N/W 4	1+05	N/W	44+33	328	656						
12	SB	PRESTON ST.	N/W 5	54+16	N/W	55+01	85	170						
13	NB	CAMDEN ST. TO PRATT ST.	S/E 15	5+10	S/E	12+45	265	530				2		
14	NB	PRATT ST. TO LOMBARD ST.	S/E 9	9+66	S/E	8+15	151	302	. :			2		
15	NB	LOMBARD STREET	S/E 6	6+75	S/E	6+25	35	70		75	35			
16	NB	LOMBARD ST. TO FAYETTE ST.	S/E 5	5+15	S/W	3+45	860	1720	101	569	294	2	1	
17	NB	FAYETTE ST. TO LEXINGTON ST.	N/E 4	4+40	N/E	6+48	208	416				1		
18	NB	LEXINGTON ST. TO SARATOGA ST.	N/E S	9+42	N/E	12+41	299	598				1	1	
19	NB	SARATOGA ST. TO MULBERRY ST.	N/E 14	4+21	N/E	15+75	154	308	154	154				
20	NB	MULBERRY ST. TO FRANKLIN ST.	N/E 16	6+25	N/E	20+95	470	940	19	19		2	1	
21	NB	FRANKLIN ST. TO MONUMENT ST.	N/E 2	1+20	N/E	28+95	775	1550	215	215		4		
22	NB	MONUMENT ST. TO MADISON ST.	N/E 29	9+75	N/E	31+75	200	400						
23	NB	MADISON ST. TO M.L. KING BLVD.	N/E 34	4+44	N/E	44+01	957	1914					1	
24	NB	PRESTON ST.	N/E 54	4+15	N/E	54+97	82	164						
		TOTALS					8606	17,212	939	1557	364	30	. 7	1

1. THIS SUMMARY OF WORK LISTS APPROXIMATE QUANTITIES OF SOME BUT NOT ALL OF THE WORK ITEMS. FOR MORE COMPLETE DETAILS, REFER TO THE OTHER CONTRACT DRAWINGS AND SPECIFICATIONS.

CONTRACT NO.

T-0857-0140

DRAWING NO.

G-4 SHEET NO.

5 OF

MARYLAND DEPARTMENT OF TRANSPORTATION

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MASS TRANSIT
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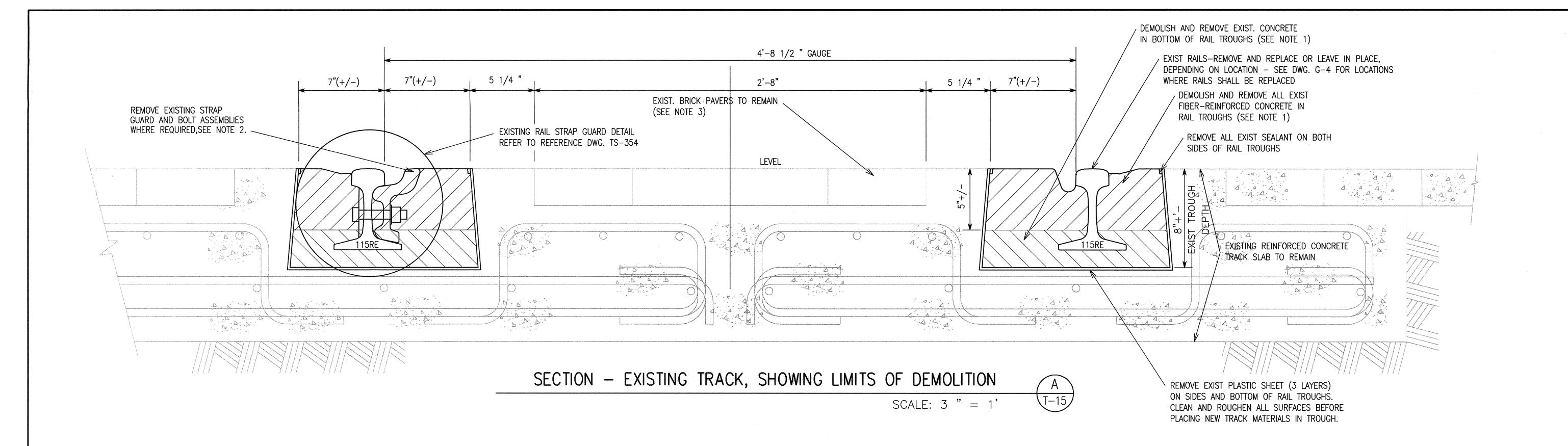
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DANIEL, MANN, JOHNSON, & MENDENHALL EARTH TECH
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			DESGN SDJ	CENTRAL LIGHT RAIL LINE
			TRS	HOWARD STREET TRACK RECONSTRUCTION PHASE II
			SHO DAS	VICINITY MAP
O. DESCRIPTION REVISIONS	BY	DATE	APPR TMK	DATE: 7/27/01 SCALE: 1"=300'-0'



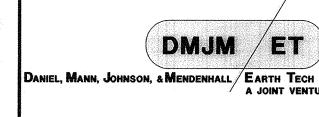


- 1. IN APPROXIMATELY 400 FEET OF RAILS, THE EXIST RAIL TROUGH IS FILLED WITH POLYMER CONCRETE (12,000 PSI DESIGN COMPRESSIVE STRENGTH).
- STRAP GUARD SHALL BE REMOVED AT LOCATIONS WHERE IT IS FASTENED TO RUNNING RAILS THAT ARE TO BE REPLACED, AS SHOWN ON DRAWING G-4. DO NOT REMOVE STRAP GUARD WHERE RUNNING RAILS ARE TO REMAIN
- BRICK PAVERS ARE NOT IN ALL LOCATIONS. IN MANY AREAS, EXISTING TRACK SLAB IS ALL CAST-IN-PLACE CONCRETE.

MARYLAND DEPARTMENT OF TRANSPORTATION

MASS TRANSIT
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MASS TRANSIT ADMINISTRATION



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).	DESCRIPTION		BY	DATE	TMK	
		REVISIONS			API LIMIK	DATE: 7/27/01

CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II LIMITS OF DEMOLITION IN EXISTING TRACKS

DRAWING NO. T-15

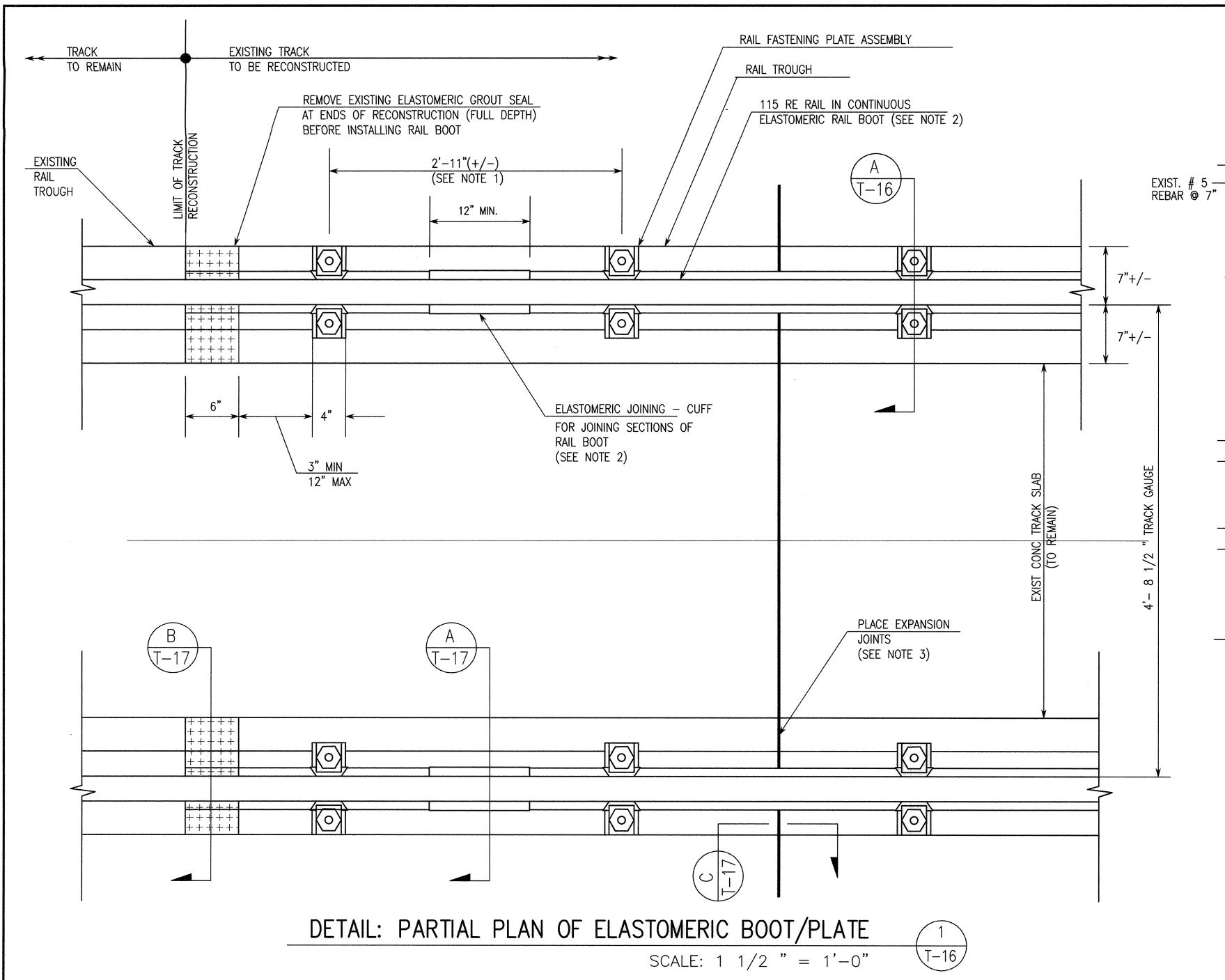
CONTRACT NO.

T-0857-0140

SHEET NO. 6 OF

SCALE: AS SHOWN





- 1. AVOID DRILLING INTO EXISTING REBARS IN TRACK SLAB. DETECT AND MARK REBARS BEFORE DRILLING HOLES FOR ANCHOR BOLTS FOR RAIL FASTENING PLATES. SPACING OF PLATES MAY BE ADJUSTED, AS REQUIRED TO AVOID REBARS. MAXIMUM ALLOWABLE SPACING OF PLATES SHALL BE 3'-3"
- 2. RAIL BOOT SUPPLIED IN APPROXIMATELY 200 FT LENGTHS. DO NOT CUT RAIL BOOT EXCEPT AS REQUIRED AT ENDS OF RECONSTRUCTION. TO MINIMIZE NUMBER OF JOINING CUFFS REQUIRED.
- 3. PLACE EXPANSION JOINTS IN RAIL TROUGH CONCRETE. TO MATCH EXISTING JOINTS IN EXISTING TRACK SLAB.
- 4. EMBEDDED TRACK SHALL BE INSTALLED WITH ZERO RAIL CANT AND NO SUPERELEVATION.

7"+/-

1 1/8 "+/-

(SEE NOTE 6)

SECTION - EMBEDDED RAIL, SHOWN AT RAIL FASTENING PLATE

— EXIST. CONC.

BASE SLAB

— EXIST. # 5

7"+/-

- EXIST. CONC.

BASE SLAB

SCALE: 1/2 " = 1" $\sqrt{1-16}$ T-25

- 5. REFER TO SPECIAL PROVISIONS FOR FURTHER DETAILS OF ANCHOR ROD ASSEMBLY. CONTRACTOR MAY PROPOSE ALTERNATE ANCHORING DESIGN FOR APPROVAL.
- 6. IF EXISTING RAIL TROUGH IS TOO SHALLOW TO FIT THE RAIL BOOT AND PLATE, GRIND OR CHIP EXISTING CONCRETE, AS REQUIRED.

MARYLAND DEPARTMENT OF TRANSPORTATION

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MASS TRANSIT ADMINISTRATION

MASS TRANSIT

MASS TRANSIT ADMINISTRATION

ITEM NO.



CONCRETE

DMJM /ET

BILL OF MATERIAL - ELASTOMERIC BOOT/PLATE

JOINING CUFF FOR ELASTOMERIC RAIL BOOT, 12" LENGTH (SEE DWG T-17, SECTION A)

FULLY-THREADED ANCHOR ROD WITH FLATTENED END, 7/8" DIA X 10"

ANCHOR ADHESIVE (SEE NOTE 5)

STEEL PLATE, 1/2"X4"X 11"

COMPRESSION CLIP

RAIL CLIP INSULATOR

ELASTOMERIC RAIL BOOT - CONTINUOUS

HEIGHT ADJUSTMENT SHIM(S) - VARIABLE THICKNESS

HEAVY-HEX NUT AND LOCK WASHER, 7/8" DIA

DESCRIPTION - MATERIAL SUPPLIED BY CONTRACTOR

SEALER/ADHESIVE FOR ADHERING/JOINING CUFF TO ELASTOMERIC RAIL BOOT (SEE DWG T-17, SECTION A)

ELASTOMERIIC GROUT - TO SEAL ENDS OF RECONSTRUCTED TRACK (SEE NOTE DWG T-17, SECTION B)

THE MICHAEL LE
S. S
STONAL SHOWS
Jean 200 W. ENGRADOR

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				RAWN [TRS	HOW
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0.	DESCRIPTION	BY	DATE	PR (TMK	
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WARD STREET TRACK RECONSTRUCTION PHASE II TAILS-ELASTOMERIC BOOT/PLATE-SHT 1 OF 2 E: 7/27/01 SCALE: AS SHOWN

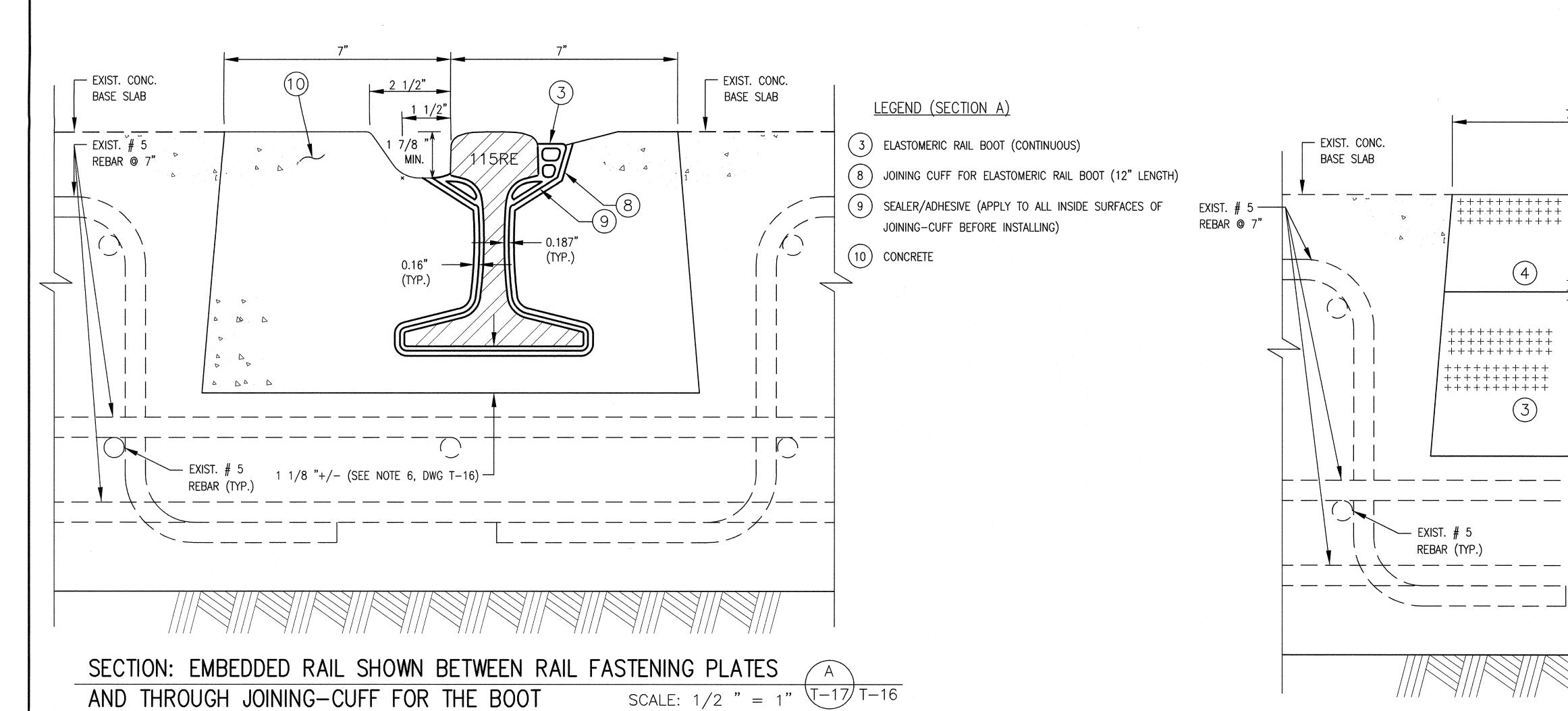
CENTRAL LIGHT RAIL LINE

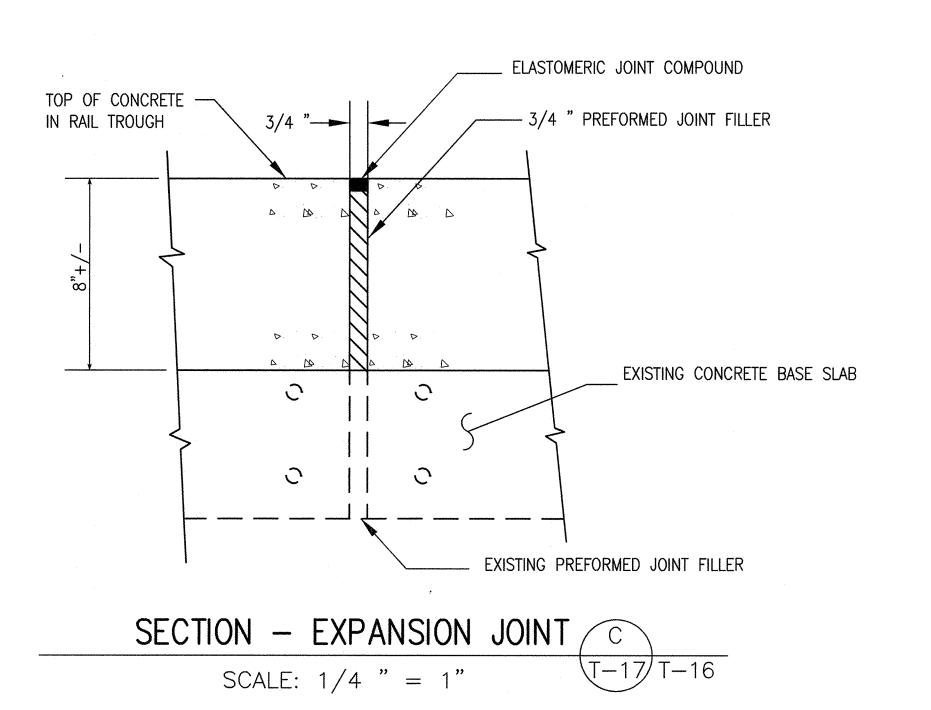
T-0857-0140 DRAWING NO. T-16 SHEET NO.

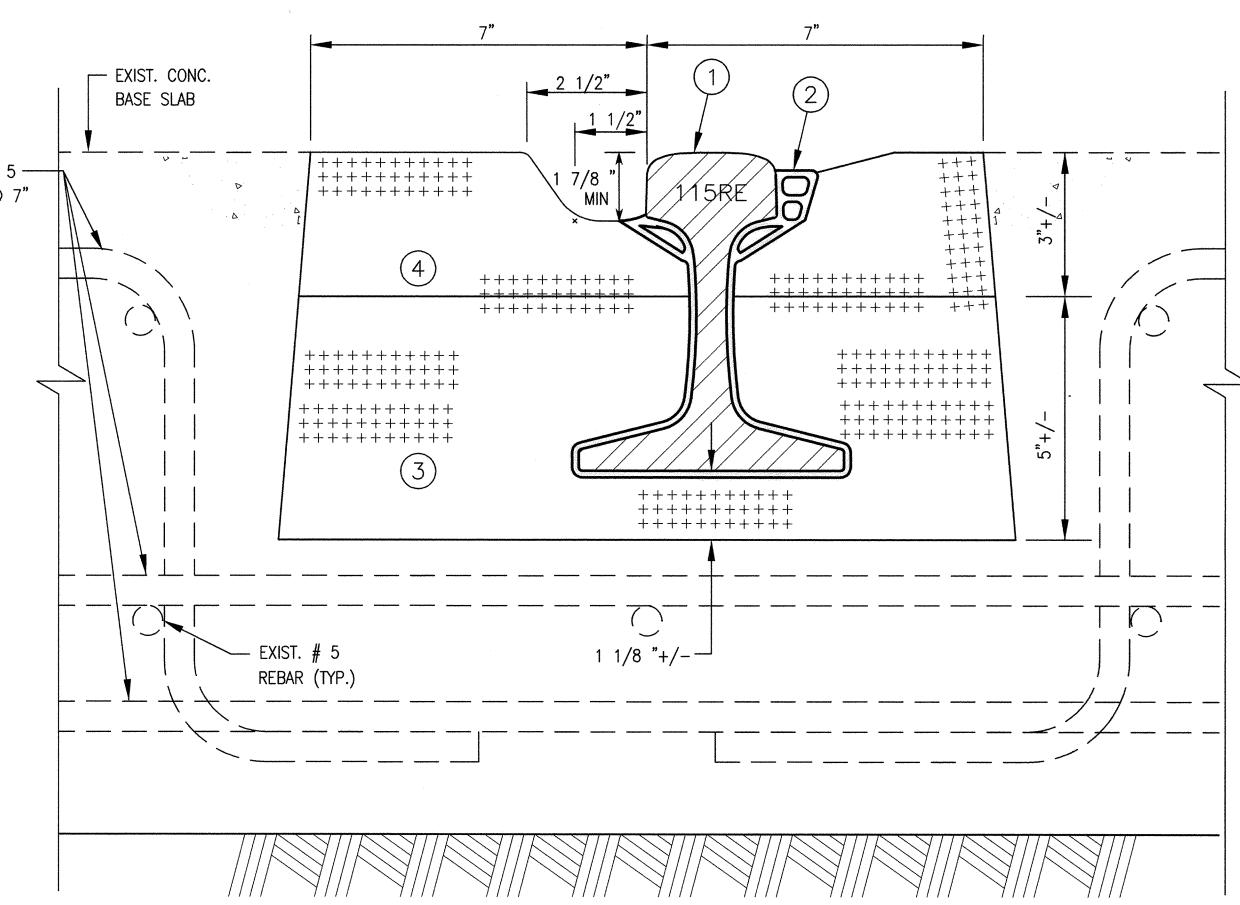
CONTRACT NO.

7 OF .









LEGEND (SECTION B)

SECTION - EMBEDDED RAIL AT ENDS OF RECONSTRUCTION

- 1) 115 RE RAIL
- (2) ELASTOMERIC RAIL BOOT (CONTINUOUS)
- ELASTOMERIC GROUT FIRST POUR
- (4) ELASTOMERIC GROUT SECOND POUR

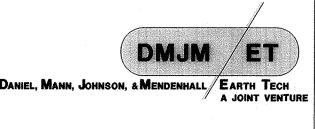
DATE: 7/27/01

MARYLAND DEPARTMENT OF TRANSPORTATION



MASS TRANSIT
ADMINISTRATION

MASS TRANSIT ADMINISTRATION MASS TRANSIT



OF MICHAEL STEERS OF STEER
POWAL ENGINE

	1					DESGN	SDJ
						DRAWN	TRS
						CHECK	DAS
A CO	NO.	DESCRIPTION		BY	DATE	APPR	TMK
		REVISIONS					

CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II
DETAILS-ELASTOMERIC BOOT/PLATE-SHT 2 OF 2

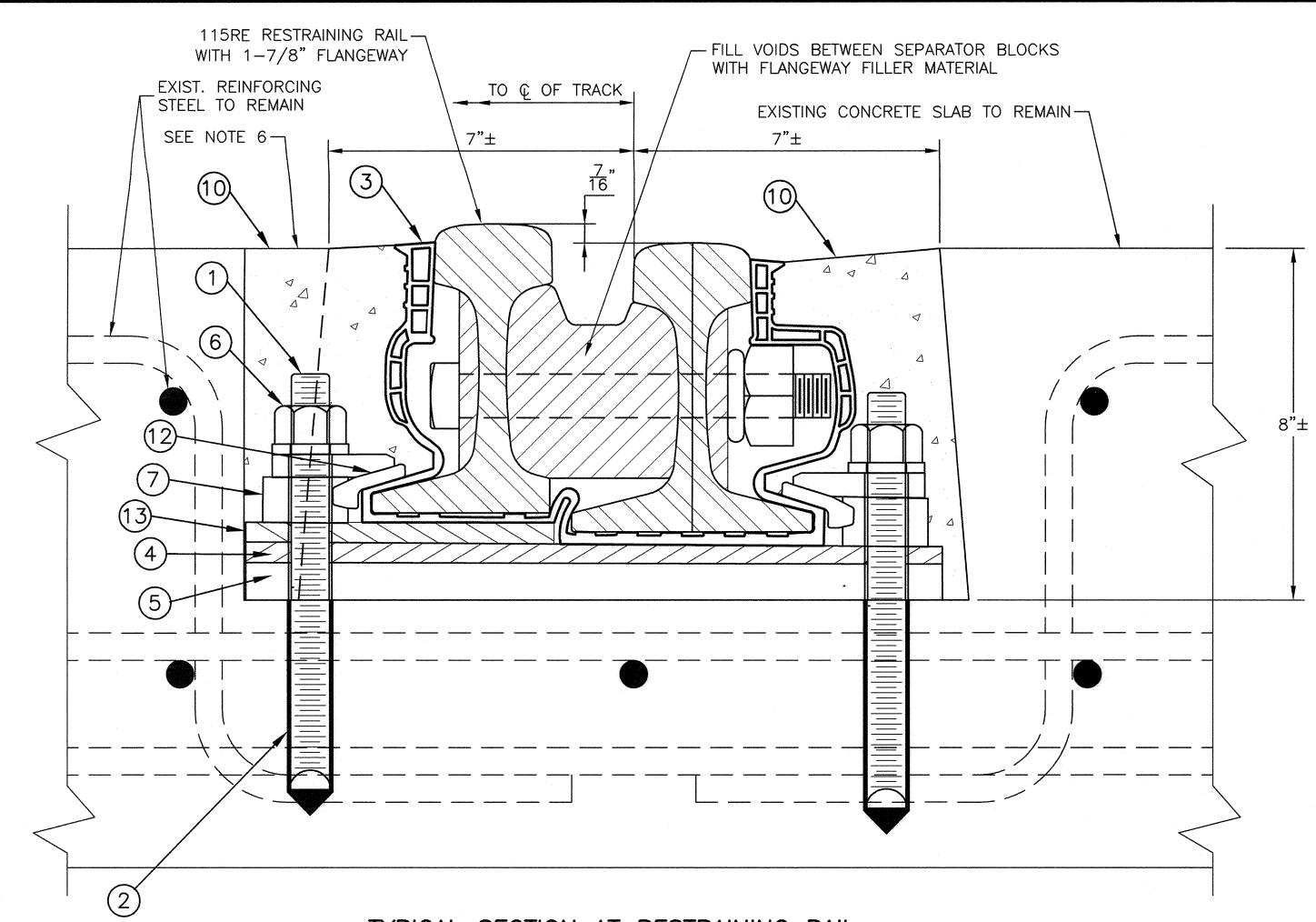
T-0857-0140 DRAWING NO. T-17

CONTRACT NO.

SHEET NO. 8 OF

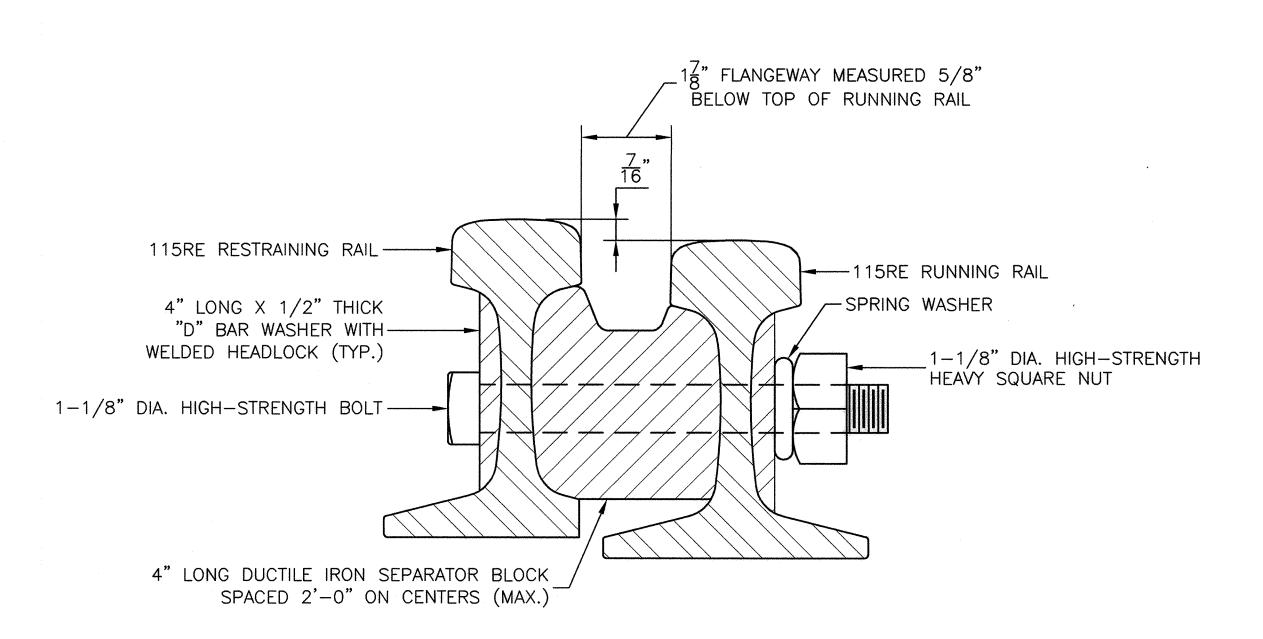
SCALE: AS SHOWN

SCALE: 1/2 " = 1" $\sqrt{1-17}$ T-16



TYPICAL SECTION AT RESTRAINING RAIL FOR ADDITIONAL DETAILS, SEE TYPICAL SECTION AT UPPER RIGHT SCALE: 1/2"=0'-1"

		BILL OF MATERIAL - ELASTOMERIC BOOT/PLATE FOR TWO RAILS
ITEM NO.	QUANTITY PER ASSEMBLY	DESCRIPTION - MATERIAL SUPPLIED BY CONTRACTOR
1	2 EACH	FULLY-THREADED ANCHOR ROD WITH FLATTENED END, 7/8" DIA X 10"
2	AS REQ'D	ANCHOR ADHESIVE (SEE NOTE 5, DWG. T-16)
3	AS REQ'D	ELASTOMERIC RAIL BOOT FOR TWO RAILS - CONTINUOUS
4	1	STEEL PLATE, 1/2"X4"X 16"
<u>(5)</u>	AS REQ'D	HEIGHT ADJUSTMENT SHIM(S) - VARIABLE THICKNESS
6	2 EACH	HEAVY-HEX NUT AND LOCK WASHER, 7/8" DIA
Ø	2 EACH	COMPRESSION CLIP
8	AS REQ'D	JOINING CUFF FOR ELASTOMERIC RAIL BOOT FOR TWO RAILS, 12" LENGTH (SIMILAR TO DWG T-17, SECTION A)
9	AS REQ'D	SEALER/ADHESIVE FOR ADHERING/JOINING CUFF TO ELASTOMERIC RAIL BOOT (SEE DWG T-17, SECTION A)
(1)	AS REQ'D	CONCRETE
1	AS REQ'D	ELASTOMERIIC GROUT - TO SEAL ENDS OF RECONSTRUCTED TRACK (SEE NOTE DWG T-17, SECTION B)
(2)	2 EACH	RAIL CLIP INSULATOR
(13)	1	STEEL PLATE, 7/16"X4"X 7"



TYPICAL SECTION AT RESTRAINING RAIL (ELASTOMERIC GROUT AND EXISTING SLAB OMITTED FOR CLARITY)

SCALE: 1/2"=0'-1"

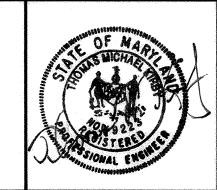
NOTES

- 1. SIDE PLANING AT END OF RESTRAINING RAIL SHALL MATCH FLANGEWAY IN ADJACENT PAVEMENT.
- NOT USED
- RESTRAINING RAIL ENDING IN OPEN BALLASTED TRACK SHALL HAVE PLANED FLARES SIMILAR TO AREMA PLAN NO. 504-89.
- 4. FOR RESTRAINING RAIL LOCATIONS, SEE DWG.
- TRACK GAUGE AT RESTRAINING RAIL AREAS SHALL BE 4'-8-3/4".
- 6. SAW CUT AND REMOVE SLICE OF EXISTING CONCRETE TRACK SLAB INSIDE OF RAIL TROUGH AS REQUIRED TO FIT RESTRAINING RAIL, BOOT AND FASTENING PLATES. DO NOT CUT REINFORCING STEEL EXCEPT WITH APPROVAL OF ENGINEER.
- AT RESTRAINING RAIL JOINTS, PROVIDE 10-INCH LONG SEPARATOR BLOCKS WITH 10-INCH LONG, 1/2" THICK D-BAR WASHERS AND TWO 1-1/8" DIAMETER HIGH-STRENGTH BOLTS PER SEPARATOR BLOCK. CENTER BLOCKS ON THE RAIL JOINTS.
- WELD THE JOINTS IN THE RUNNING RAILS. LOCATE SEPARATOR BLOCKS WITH THE NEARER EDGE OF THE BLOCK AT LEAST 6 INCHES FROM THE CENTER OF THE WELD.

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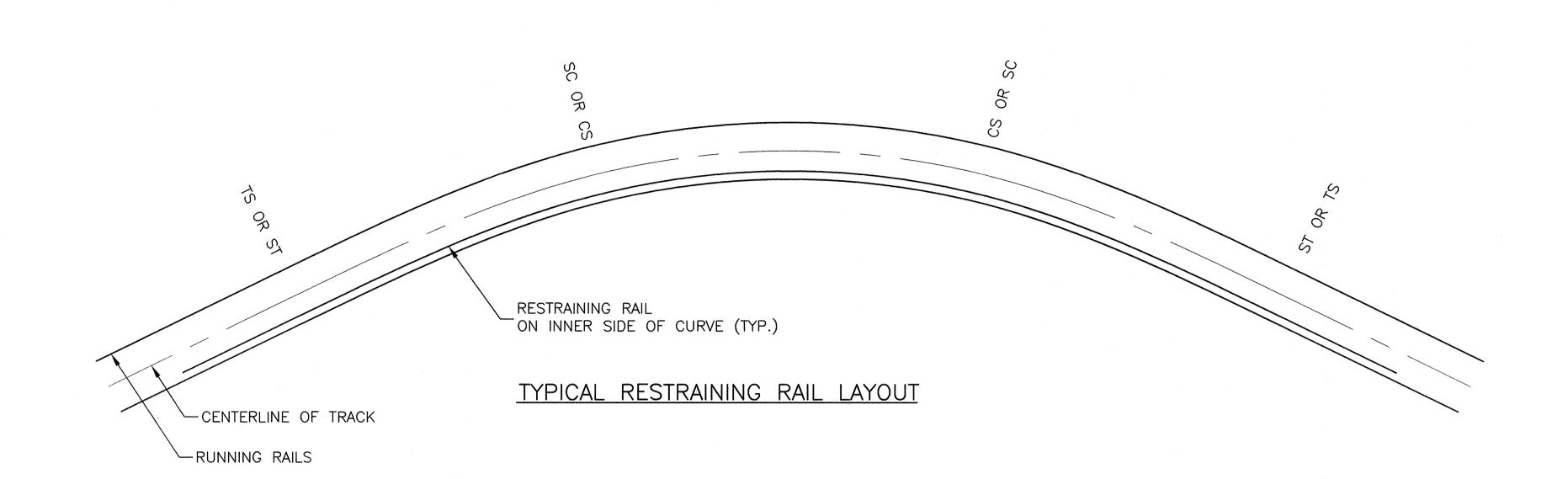
CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II
DETAILS - RESTRAINING RAIL AND RAIL BOOT

SHEET NO. 9 OF SCALE: AS NOTED

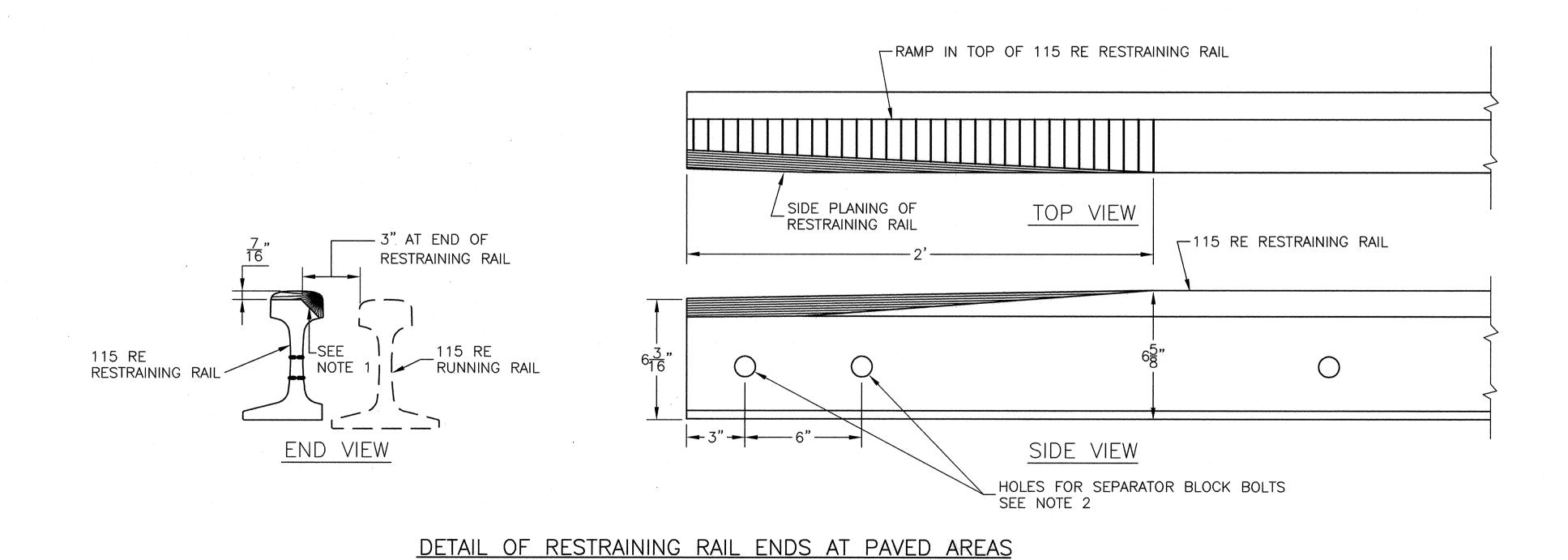
CONTRACT NO.

T-0857-0140

DRAWING NO.



		RESTRA	AINING RAI	L LOCA	TIONS
CURVE NO.	CURVE RADIUS (FEET)	BEGINNING OF RESTRAINING RAIL STA.	END OF RESTRAINING RAIL STA.	SIDE OF CURVE	EQUATIONS WITHIN LIMITS OF RESTRAINING RAIL
S/W 2 (NOTE 2)	VARIES (SPIRAL)	S/W 6+33	S/W 6+68	INNER	NONE
S/E 2 (NOTE 2)	VARIES (SPIRAL)	S/E 6+33	S/E 6+68	INNER	NONE
S/E 1	387.50 & SPIRALS	S/E 0+18	S/E 1+35	INNER	NONE
N/E 1	400.00 & SPIRALS	S/E 0+00 N/E 0+00	S/E 0+28 N/E 1+19	INNER INNER	N/E 0+00 BACK = S/E 0+00 AHEAD N/W 0+00 BACK = S/W 0+00 AHEAD



SCALE: 3"=1'-0"

NOTES:

- 1. PORTIONS OF SOME CURVES SHALL HAVE DOUBLE RESTRAINING RAIL DUE TO EXTENSION OF RESTRAINING RAIL FROM ADJACENT CURVE.
- 2. LIMITS OF RESTRAINING RAIL IN LOMBARD STREET ARE PRELIMINARY.
 FURTHER DETAILS WILL BE PROVIDED TO CONTRACTOR BY THE ENGINEER.

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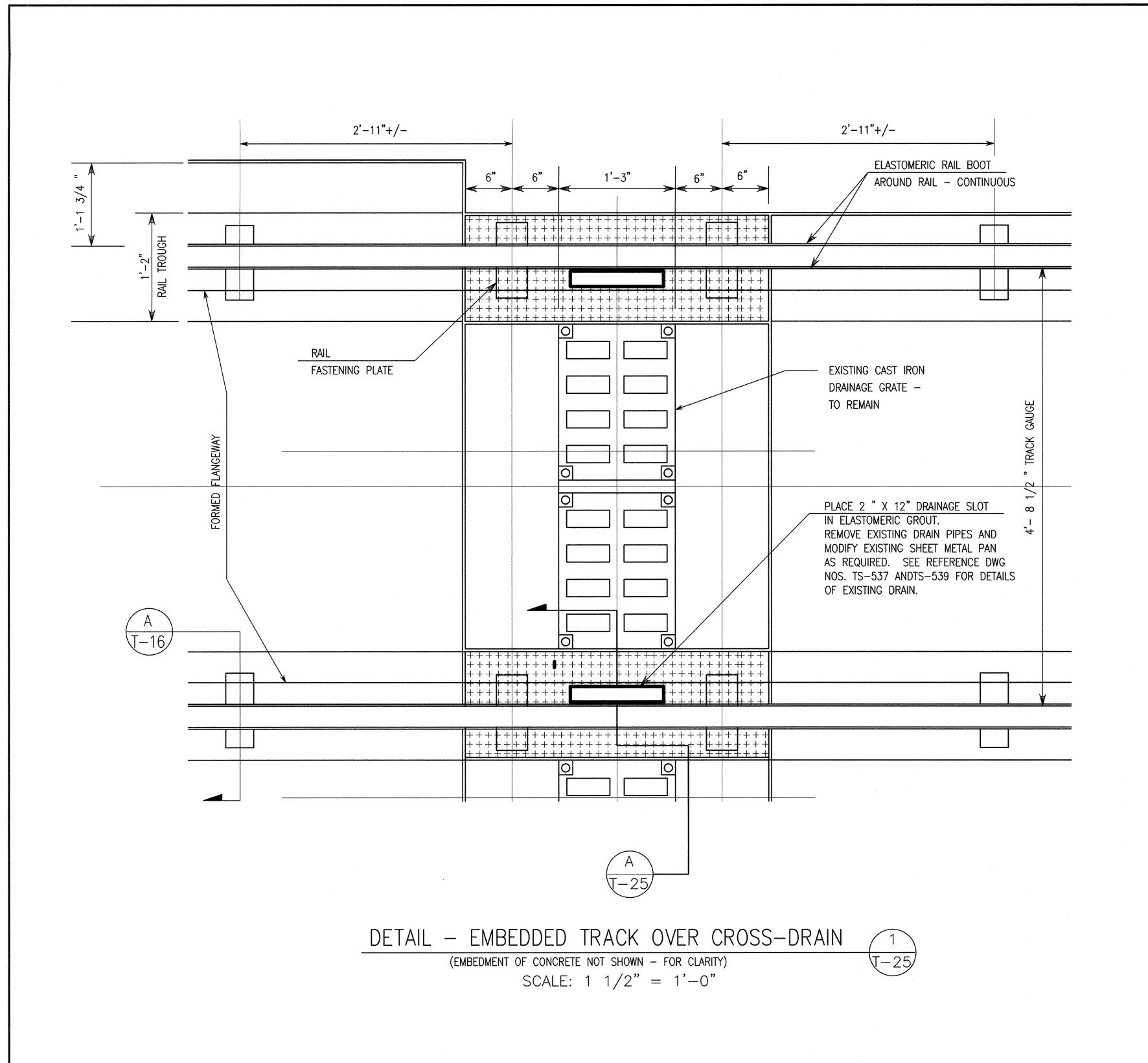
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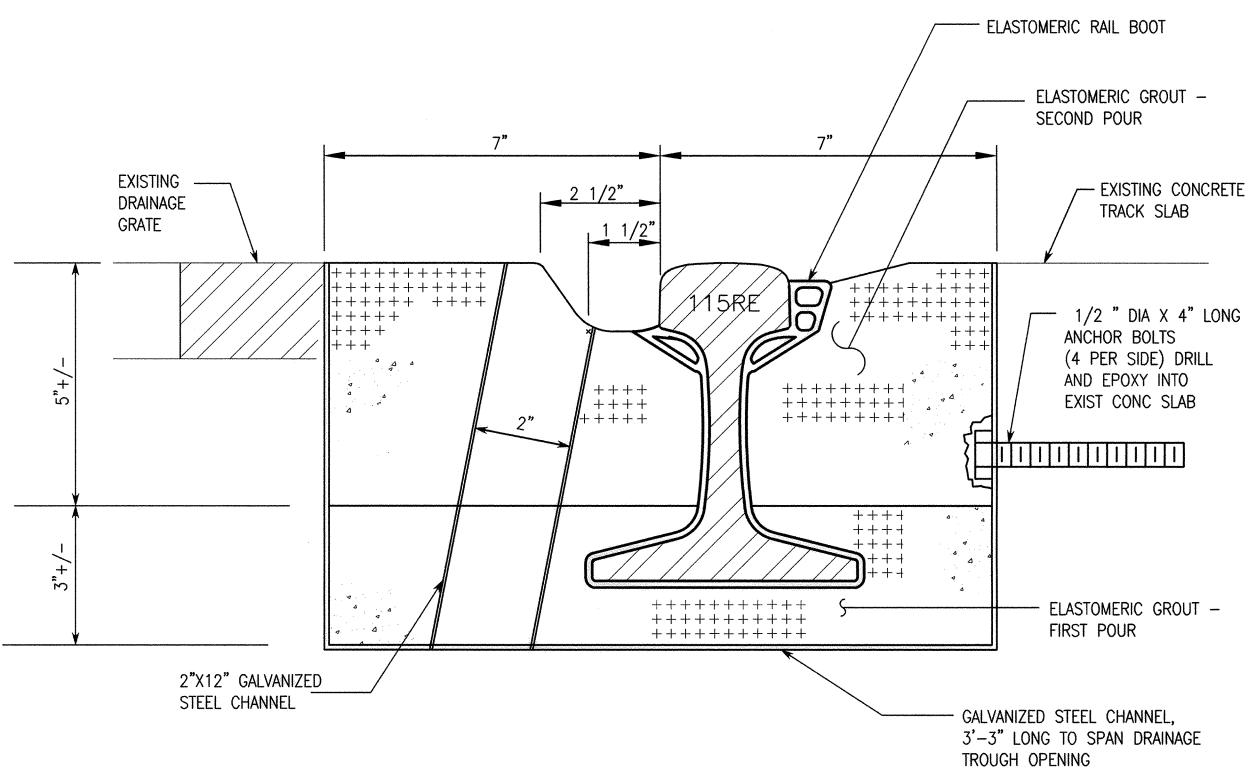
CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II

RESTRAINING RAIL LAYOUT AND DETAIL DATE: 7/27/01 SCALE: NONE

CONTRACT NO. T-0857-0140 DRAWING NO. T-21 SHEET NO. 10 OF





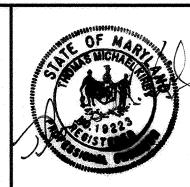


SECTION - EMBEDDED RAIL OVER TRACK CROSS DRAIN SCALE: 1/2 " = 1"

DATE: 7/27/01

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MARYLAND DEPARTMENT OF TRANSPORTATION



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CENTRAL LIGHT RAIL LINE HOWARD STREET TRACK RECONSTRUCTION PHASE II

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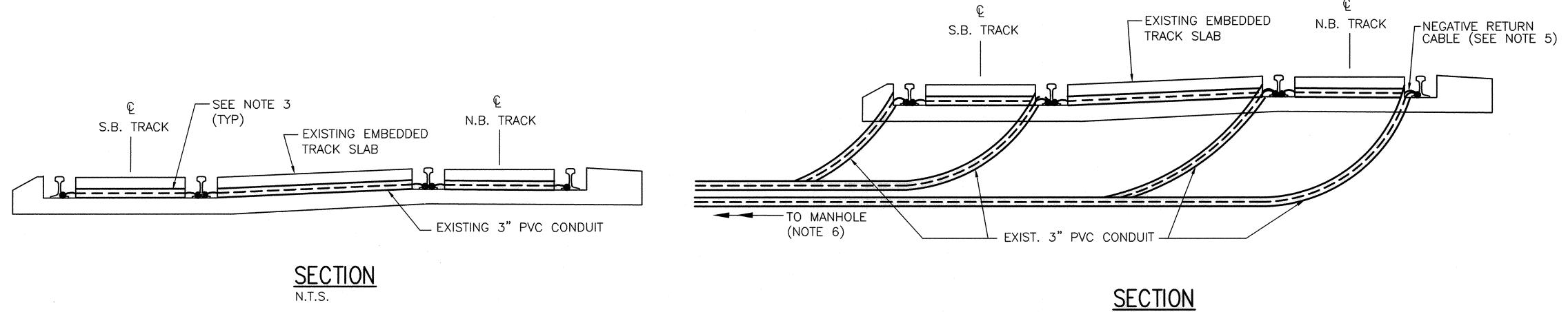
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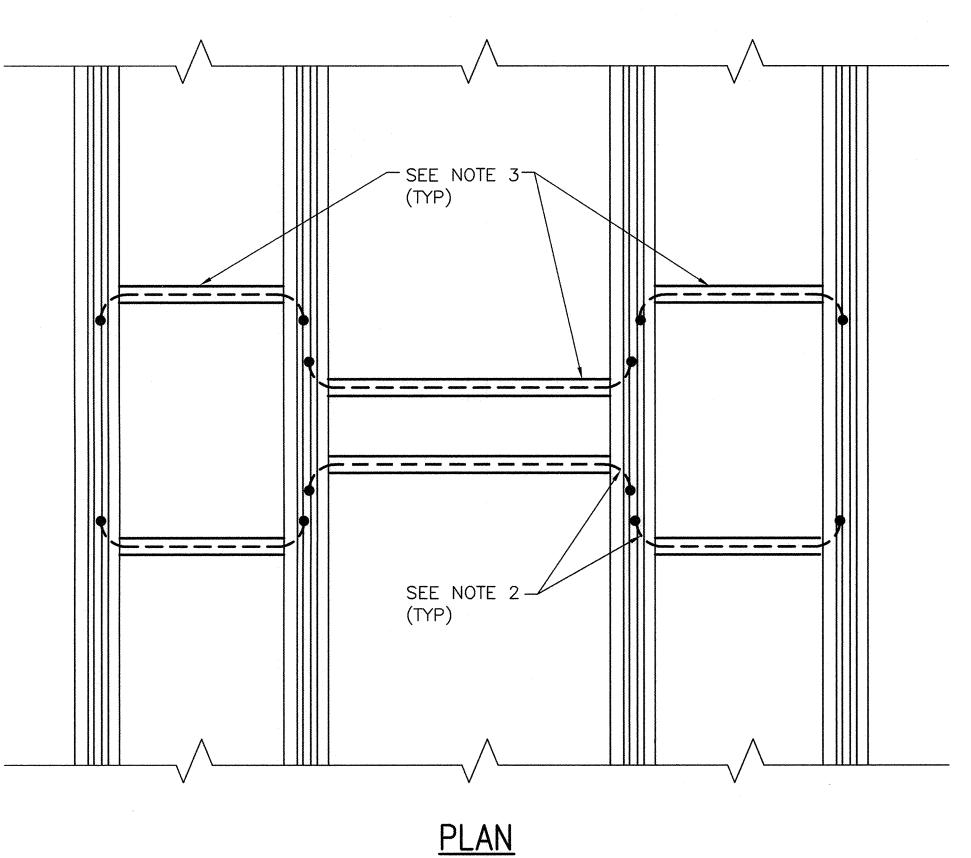
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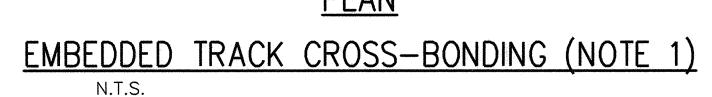
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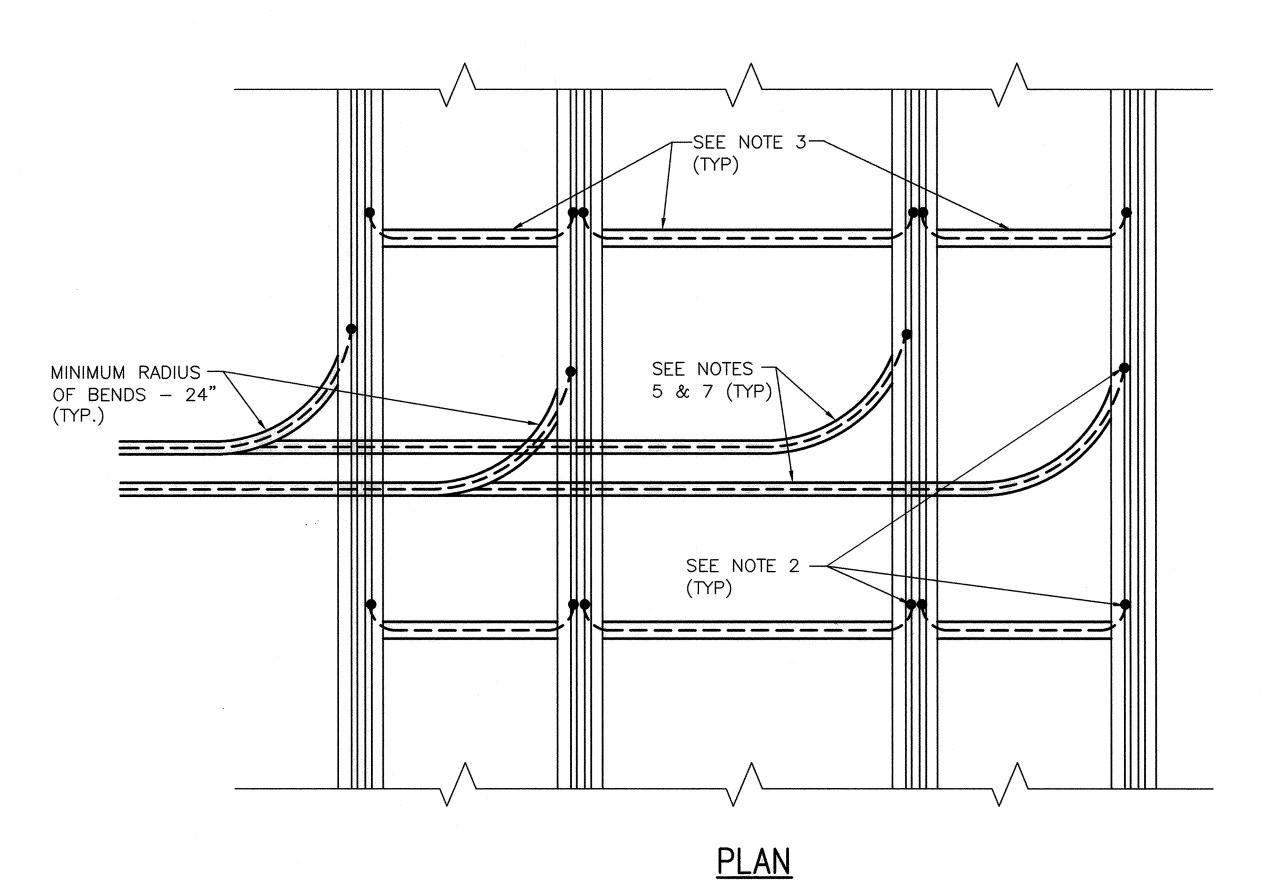
SCALE: AS SHOWN











EMBEDDED TRACK— NEGATIVE RETURN CABLES
REQUIRED AT STA N/W & N/E 29+60
N.T.S.

1. ALL CROSSBONDING CABLES SHALL BE 500 MCM, INSULATED CABLES INSTALLED AT THE FOLLOWING LOCATIONS:

EMBEDDED TRACK

STA. N/E 1+00

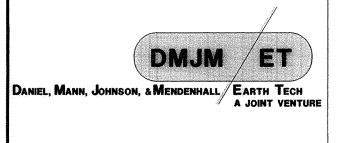
STA. N/E & N/W 10+00

STA. N/E & N/W 20+00

STA. N/E 40+00 STA. N/W 29+66

- ALL CABLES SHALL BE EXOTHERMICALLY CONNECTED TO THE RAIL ENDS AND INSULATED AS SPECIFIED.
- 3. INSTALL ONE-500 MCM INSULATED CROSSBOND CABLE IN EACH 3-INCH PVC CONDUIT.
- 4. SEAL PVC CONDUIT WITH DUCT SEAL (OR EQUIVALENT) AFTER CABLES HAVE BEEN INSTALLED.
- 5. INSTALL TWO 500 MCM INSULATED NEGATIVE RETURN CABLES IN EACH 3-INCH PVC CONDUIT.
- 6. NEGATIVE RETURN CONDUITS SHALL REMAIN CONNECTED INTO MANHOLE INSTALLED IN SIDEWALK.
- 7. ALL CONCRETE ENCASED CONDUITS SHALL HAVE A MINIMUM OF 3—INCHES OF COVER.

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CENTRAL LIGHT RAIL LINE
HOWARD STREET TRACK RECONSTRUCTION
PHASE II
REPLACEMENT OF CROSS-BONDING & NEG RET CAB

T-0857-0140

DRAWING NO.

CONTRACT NO.

SHEET NO.

12 OF ____

12 OF _

SCALE: AS SHOWN